

## WRITING CHEMICAL FORMULAS FOR IONIC COMPOUNDS

A chemical formula tells you two very important things about that compound:

- 1) the type of elements present in the compound
- 2) the number of atoms of each type of element

In order to write chemical formulas for different compounds, you must know the symbols for the elements and polyatomic ions, plus have an understanding of electron configuration and how elements and polyatomic ions combine with one another.

Different elements combine in distinct ways with other elements to form a compound. This ability of an element to combine with other elements is called its **COMBINING CAPACITY**. Multivalent metals can form two or more positive ions with different ionic charges, and therefore, will have multiple combining capacities. This will always be indicated in the name of the compound with the use of roman numerals.

### RULES FOR WRITING CHEMICAL FORMULAS

**\*\* Remember:** If the second word in the name of a compound ends in “ide”, this tells you that the compound is made up of two elements only, there is no polyatomic ion (radical group) present.

1. Write down the symbols for the elements and/or polyatomic ions in the order they appear.
2. Find and record the combining capacity (CC) for each element and/or polyatomic ion as a superscript. Some elements have more than one CC, therefore, this is indicated in the name of the compound.

Eg. Copper (II) Fluoride -----  $\text{CuF}_2$

3. The formula is written by crossing the CC's to make subscripts for each element or polyatomic ion. Remember that polyatomic ions are indicated by brackets unless the crossing CC is one.
4. Reduce the subscripts.

## EXAMPLES:

### Silver Oxide

1. Symbols: Ag O
2. CC's:  $\text{Ag}^1$   $\text{O}^2$
3. Cross CC's:  $\text{Ag}_2$   $\text{O}_1$
4. The chemical formula for Silver Oxide is  $\text{Ag}_2\text{O}$   
\*\*Remember: The subscript 1 is never written.

### Zinc Sulphate

1. Symbols: Zn  $\text{SO}_4$
2. CC's:  $\text{Zn}^2$   $(\text{SO}_4)^2$
3. Cross CC's:  $\text{Zn}_2$   $(\text{SO}_4)_2$
4. The chemical formula for Zinc Sulphate is  $\text{Zn}_2(\text{SO}_4)_2$  which can be reduced to  $\text{ZnSO}_4$